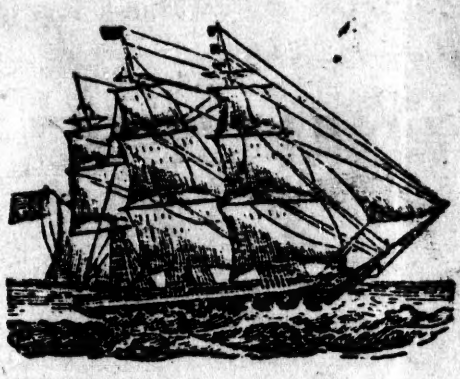
ARITHMETICAL TABLES,

DESIGNED FOR THE USE OF

SCHOOLS IN CANADA.

BY PETER PARLEY.



TORONTO:

PRINTED & SOLD BY LESSLIE, BROTHERS,

110½ KING STREET.

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LESSLIE, BROTHERS,

110½ King Street.

ADVERTISEMENT.

PETER PARLEY would inform his young friends that the ARITHMETICAL TABLES now offered for their use at School, possess, at least, two advantages over the English and American ones heretofore in use in Canada. It is less than half the price of the former, with none of the objectionable features of the latter, while it comprehends all that is really useful in both. He believes that there is no book of the kind in the Province that contains so much instruction in so small a compass.

Toronto, Canada, 1841.

ROMAN AND ARABIC CHARACTERS.

Roman.	Arabic.	Roman.	Arabic.
I. One	1	XXVI. Twenty-six	26
II. Two	2	XXVII. Twenty-seven	27
III. Three	3	XXVIII. Twenty-eight	28
IV. Four	4	XXIX. Twenty-nine	29
V. Five	5	XXX. Thirty	30
VI. Six	6	XL. Forty	40
VII. Seven	7	L. Fifty	50
VIII. Eight	8	LX. Sixty	60
IX. Nine	9	LXX. Seventy	70
X. Ten	10	LXXX. Eighty	80
XI. Eleven	11	XC. Ninety	90
XII. Twelve	12	C. One hundred	100
XIII. Thirteen	13	CC. Two hundred	200
XIV. Fourteen	14	CCC. Three hundred	300
XV. Fifteen	15	CCCC. Four hundred	400
XVI. Sixteen	16	D. Five hundred	500
XVII. Seventeen	17	DC. Six hundred	600
XVIII. Eighteen	18	DCC. Seven hundred	700
XIX. Nineteen	19	DCCC. Eight Hundred	800
XX. Twenty	20	DCCCC. Nine Hundred	900
XXI. Twenty-one	21	M. One thousand	1000
XXII. Twenty-two	22	MDCCCXLI. One thousand eight hundred & Forty-one.	1841
XXIII. Twenty-three	23		
XXIV. Twenty-four	24		
XXV. Twenty-five	25		

Note.—A smaller number, placed after a greater, augments the value of the gr ater; if put before it diminishes it. Thus, VI is 6; IV is 4; XI is 11; IX is 9, &c. By thus combining the above letters, any number may be formed.

NUMERATION AND NOTATION.

NUMERATION is the art of Reading or Writing any Number.
NOTATION is the art of writing Numbers in figures.

NUMERATION TABLE.

9 Units.
9 8 Tens.
9 8 7 Hundreds.
9 8 7 6 Thousands.
9 8 7 6 5 Tens of Thousands.
9 8 7 6 5 4 Hundreds of Thousands.
9 8 7 6 5 4 3 Millions.
9 8 7 6 5 4 3 2 Tens of Millions.
9 8 7 6 5 4 3 2 1 Hundreds of Millions.

Quintillions.	Quadrillions.	Trillions.	Billions	Millions.	Units.
987,	654. 321,	987. 654,	321. 987,	654. 321,	987. 654, 321.

MONEY TABLE.

NOTE.—£ denotes Libræ, or pounds
s denotes Solidi. or shillings.
d denotes Denarii, or pence.
qrs denotes Quadrantes, or farthings.
¼ denotes a Farthing.
½ denotes Two Farthings, or half-penny.
¾ denotes Three Farthings.

MONEY TABLE.

FARTH.		PENCE.						SHILLINGS.								
qrs.	d	d	s	d	d	s	d	s	£	s	s	£	s	s	£	s
4	1	12	1	0	39	3	3	20	1	0	47	2	7	74	3	14
5	1¼	13	1	1	40	3	4	21	1	1	48	2	8	75	3	15
6	1½	14	1	2	41	3	5	22	1	2	49	2	9	76	3	16
7	1¾	15	1	3	42	3	6	23	1	3	50	2	10	77	3	17
8	2	16	1	4	43	3	7	24	1	4	51	2	11	78	3	18
9	2¼	17	1	5	44	3	8	25	1	5	52	2	12	79	3	19
10	2½	18	1	6	45	3	9	26	1	6	53	2	13	80	4	0
11	2¾	19	1	7	46	3	10	27	1	7	54	2	14	81	4	1
12	3	20	1	8	47	3	11	28	1	8	55	2	15	82	4	2
13	3¼	21	1	9	48	4	0	29	1	9	56	2	16	83	4	3
14	3½	22	1	10	49	4	1	30	1	10	57	2	17	84	4	4
15	3¾	23	1	11	50	4	2	31	1	11	58	2	18	85	4	5
16	4	24	2	0	51	4	3	32	1	12	59	2	19	86	4	6
17	4¼	25	2	1	52	4	4	33	1	13	60	3	0	87	4	7
18	4½	26	2	2	53	4	5	34	1	14	61	3	1	88	4	8
19	4¾	27	2	3	54	4	6	35	1	15	62	3	2	89	4	9
20	5	28	2	4	55	4	7	36	1	16	63	3	3	90	4	10
21	5¼	29	2	5	56	4	8	37	1	17	64	3	4	91	4	11
22	5½	30	2	6	57	4	9	38	1	18	65	3	5	92	4	12
23	5¾	31	2	7	58	4	10	39	1	19	66	3	6	93	4	13
24	6	32	2	8	59	4	11	40	2	0	67	3	7	94	4	14
28	7	33	2	9	60	5	0	41	2	1	68	3	8	95	4	15
32	8	34	2	10	70	5	10	42	2	2	69	3	9	96	4	16
36	9	35	2	11	80	6	8	43	2	3	70	3	10	97	4	17
40	10	36	3	0	84	7	0	44	2	4	71	3	11	98	4	18
44	11	37	3	1	90	7	6	45	2	5	72	3	12	99	4	19
48	12	38	3	2	96	8	0	46	2	6	73	3	13	100	5	0

ADDITION.

John had 2 apples, and Peter gave him 1 apple; then he had 3, because 2 apples and 1 apple added together make 3 apples: Thus 2 and 1 make 3.

Jane had 2 oranges, and Mary had 2 oranges, they give them all to Catharine; then Catharine had 4; because 2 oranges added to 2 oranges make 4 oranges. Therefore 2 and 2 are 4.

Henry has 3 pears, and wants 2 more, how many will he have then?—2 pears and 3 pears make 5 pears. Then 2 and 3 are 5.

Ann has 4 pins, and Sarah has 5, they put them into a box, how many pins are there in the box?—4 pins and 5 pins added together make 9 pins. So 4 and 5 are 9. (See below.)

Thomas has 3 peaches, Isaac has 6, and Joseph has 8, they want to know how many they all have. 3 peaches and 6 peaches added together make 9 peaches. Then 9 peaches and 8 peaches added together make 17 peaches. Therefore 3 and 6 make 9, and 9 and 8 make 17.

Explanation of the Addition Table, page 7.

	1 apple.				5 pins.				
2 apples	3 apples.								
4 pins.					9 pins.				

ADDITION TABLE.

	2	3	4	5	6	7	8	9	10	11	12
2	4	5	6	7	8	9	10	11	12	13	14
3	5	6	7	8	9	10	11	12	13	14	15
4	6	7	8	9	10	11	12	13	14	15	16
5	7	8	9	10	11	12	13	14	15	16	17
6	8	9	10	11	12	13	14	15	16	17	18
7	9	10	11	12	13	14	15	16	17	18	19
8	10	11	12	13	14	15	16	17	18	19	20
9	11	12	13	14	15	16	17	18	19	20	21
10	12	13	14	15	16	17	18	19	20	21	22
11	13	14	15	16	17	18	19	20	21	22	23
12	14	15	16	17	18	19	20	21	22	23	24

ADDITION TABLE.

LESSON I.

1 and 1 are 2
1 and 2 are 3
1 and 3 are 4
1 and 4 are 5
1 and 5 are 6
1 and 6 are 7
1 and 7 are 8
1 and 8 are 9
1 and 9 are 10
1 and 10 are 11

LESSON II.

2 and 1 are 3
2 and 2 are 4
2 and 3 are 5
2 and 4 are 6
2 and 5 are 7
2 and 6 are 8
2 and 7 are 9
2 and 8 are 10
2 and 9 are 11
2 and 10 are 12

LESSON III.

3 and 1 are 4
3 and 2 are 5
3 and 3 are 6
3 and 4 are 7
3 and 5 are 8
3 and 6 are 9
3 and 7 are 10
3 and 8 are 11
3 and 9 are 12
3 and 10 are 13

LESSON IV.

4 and 1 are 5
4 and 2 are 6
4 and 3 are 7
4 and 4 are 8
4 and 5 are 9
4 and 6 are 10
4 and 7 are 11
4 and 8 are 12
4 and 9 are 13
4 and 10 are 14

LESSON V.

5 and 1 are 6
5 and 2 are 7
5 and 3 are 8
5 and 4 are 9
5 and 5 are 10
5 and 6 are 11
5 and 7 are 12
5 and 8 are 13
5 and 9 are 14
5 and 10 are 15

LESSON VI.

6 and 1 are 7
6 and 2 are 8
6 and 3 are 9
6 and 4 are 10
6 and 5 are 11
6 and 6 are 12
6 and 7 are 13
6 and 8 are 14
6 and 9 are 15
6 and 10 are 16

LESSON VII.

7 and 1 are 8
7 and 2 are 9
7 and 3 are 10
7 and 4 are 11
7 and 5 are 12
7 and 6 are 13
7 and 7 are 14
7 and 8 are 15
7 and 9 are 16
7 and 10 are 17

LESSON VIII.

8 and 1 are 9
8 and 2 are 10
8 and 3 are 11
8 and 4 are 12
8 and 5 are 13
8 and 6 are 14
8 and 7 are 15
8 and 8 are 16
8 and 9 are 17
8 and 10 are 18

LESSON IX.

9 and 1 are 10
9 and 2 are 11
9 and 3 are 12
9 and 4 are 13
9 and 5 are 14
9 and 6 are 15
9 and 7 are 16
9 and 8 are 17
9 and 9 are 18
9 and 10 are 19

LESSON X.

10 and 1 are 11
10 and 2 are 12
10 and 3 are 13
10 and 4 are 14
10 and 5 are 15
10 and 6 are 16
10 and 7 are 17
10 and 8 are 18
10 and 9 are 19
10 and 10 are 20

LESSON XI.

11 and 1 are 12
11 and 2 are 13
11 and 3 are 14
11 and 4 are 15
11 and 5 are 16
11 and 6 are 17
11 and 7 are 18
11 and 8 are 19
11 and 9 are 20
11 and 10 are 21

LESSON XII.

12 and 1 are 13
12 and 2 are 14
12 and 3 are 15
12 and 4 are 16
12 and 5 are 17
12 and 6 are 18
12 and 7 are 19
12 and 8 are 20
12 and 9 are 21
12 and 10 are 22

SUBTRACTION.

Jane has 3 apples, and Mary takes 2 of them away; how many has she left? Where there are 3 apples, take 2 of them away, and there is 1 left. So 2 from 3 leaves 1.

Charlotte having 9 pins, gives 4 of them to Eliza; then she has 5 left, because when a box has 9 pins in it, take 4 of them out and there will be 5 pins in the box. Then 4 from 9 leaves 5, or 5 from 9 leaves 4.

Peter had 17 peaches in his basket, but John took 9 of them out; then Peter had but 8 left; for where there are 17 peaches, take 9 away, and there are 8 peaches left. Therefore 9 from 17 leaves 8, or 8 from 17 leaves 9.

SUBTRACTION TABLE.

	1	2	3	4	5	6	7	8	9	10
1	0	1	2	3	4	5	6	7	8	9
2	...	0	1	2	3	4	5	6	7	8
3	.....	0	1	2	3	4	5	6	7	
4	.....	0	1	2	3	4	5	6		
5	.....	0	1	2	3	4	5			
6	.....	0	1	2	3	4				
7	.....	0	1	2	3					
8	.....	0	1	2						
9	.....	0	1							

MULTIPLICATION.

Moses had 1 knife, and Samuel had twice as many; then Samuel had 2 knives, for twice means as many again. So twice 1 are 2.

Simon has twice as many pears as Jacob, and Jacob has 2 pears, then Simon has 4 pears, because 4 pears are as many again as 2 pears. Therefore twice 2 are 4.

Charlotte, Amelia, and Eliza, have 2 oranges apiece, how many had they all? Now there being 3 of them, 2 oranges and 2 oranges make 4 oranges, and 2 more make 6 oranges. So 3 times 2 oranges make 6 oranges. Therefore 3 times 2 are 6, or twice 3 are 6.

Four boys are playing, each boy has 5 marbles, how many have they altogether? Now 5 marbles added to 5 make 10 marbles, and 5 more make 15 marbles, and 5 more make 20 marbles. then 4 times 5 marbles make 20 marbles. Consequently 4 times 5 are always 20, and 5 times 4 are 20.

MULTIPLICATION TABLE.

LESSON I.	LESSON II.	LESSON III.
Twice 1 are 2	3 times 1 are 3	4 times 1 are 4
Twice 2 are 4	3 times 2 are 6	4 times 2 are 8
Twice 3 are 6	3 times 3 are 9	4 times 3 are 12
Twice 4 are 8	3 times 4 are 12	4 times 4 are 16
Twice 5 are 10	3 times 5 are 15	4 times 5 are 20
Twice 6 are 12	3 times 6 are 18	4 times 6 are 24
Twice 7 are 14	3 times 7 are 21	4 times 7 are 28
Twice 8 are 16	3 times 8 are 24	4 times 8 are 32
Twice 9 are 18	3 times 9 are 27	4 times 9 are 36
Twice 10 are 20	3 times 10 are 30	4 times 10 are 40
Twice 11 are 22	3 times 11 are 33	4 times 11 are 44
Twice 12 are 24	3 times 12 are 36	4 times 12 are 48

LESSON IV.

5	times	1	are 5
5	times	2	are 10
5	times	3	are 15
5	times	4	are 20
5	times	5	are 25
5	times	6	are 30
5	times	7	are 35
5	times	8	are 40
5	times	9	are 45
5	times	10	are 50
5	times	11	are 55
5	times	12	are 60

LESSON V.

6	times	1	are 6
6	times	2	are 12
6	times	3	are 18
6	times	4	are 24
6	times	5	are 30
6	times	6	are 36
6	times	7	are 42
6	times	8	are 48
6	times	9	are 54
6	times	10	are 60
6	times	11	are 66
6	times	12	are 72

LESSON VI.

7	times	1	are 7
7	times	2	are 14
7	times	3	are 21
7	times	4	are 28
7	times	5	are 35
7	times	6	are 42
7	times	7	are 49
7	times	8	are 56
7	times	9	are 63
7	times	10	are 70
7	times	11	are 77
7	times	12	are 84

LESSON VII.

8	times	1	are 8
8	times	2	are 16
8	times	3	are 24
8	times	4	are 32
8	times	5	are 40
8	times	6	are 48
8	times	7	are 56
8	times	8	are 64
8	times	9	are 72
8	times	10	are 80
8	times	11	are 88
8	times	12	are 96

LESSON VIII.

9	times	1	are 9
9	times	2	are 18
9	times	3	are 27
9	times	4	are 36
9	times	5	are 45
9	times	6	are 54
9	times	7	are 63
9	times	8	are 72
9	times	9	are 81
9	times	10	are 90
9	times	11	are 99
9	times	12	are 108

LESSON IX.

10	times	1	are 10
10	times	2	are 20
10	times	3	are 30
10	times	4	are 40
10	times	5	are 50
10	times	6	are 60
10	times	7	are 70
10	times	8	are 80
10	times	9	are 90
10	times	10	are 100
10	times	11	are 110
10	times	12	are 120

LESSON X

11	times	1	are 11
11	times	2	are 22
11	times	3	are 33
11	times	4	are 44
11	times	5	are 55
11	times	6	are 66
11	times	7	are 77
11	times	8	are 88
11	times	9	are 99
11	times	10	are 110
11	times	11	are 121
11	times	12	are 132

LESSON XII.

12 times 1 are 12	12 times 5 are 60	12 times 9 are 108
12 times 2 are 24	12 times 6 are 72	12 times 10 are 120
12 times 3 are 36	12 times 7 are 84	12 times 11 are 132
12 times 4 are 48	12 times 8 are 96	12 times 12 are 144

DIVISION.

A man has 2 apples to divide between his two children, how many will each have? They will each have 1, because 2 ones make 2. Therefore 2 will go into 2 once, 3 into 3 once, 4 into 4 once, &c.

Harriet has 4 pears to divide equally between Mary and Jane. Then Mary will have 2 pears, and Jane will have 2 pears, because twice 2 pears make 4 pears.

Richard, Henry, and Silas, have 6 oranges divided equally between them. Now there being 3 of them, each boy will have 2, because there are 3 2's in 6, or 3 times 2 oranges make 6 oranges. Then 3 will go into 6 twice, or 2 times, and 2 will also go into 6, 3 times.

The master divides 20 marbles amongst 4 good boys, how many marbles has each boy? Now if 20 marbles be divided into 4 equal shares, there will be 5 marbles in each share; because 4 times 5 marbles make 20 marbles: then 4 will go into 20, 5 times; and 5 into 20, 4 times.

MULTIPLICATION AND DIVISION TABLE.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	3.
3	6	9	12	15	18	21	24	27	30	33	36	39	42	45	48
4	8	12	16	20	24	28	32	36	40	44	48	52	56	60	64
5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80
6	12	18	24	30	36	42	48	54	60	66	72	78	84	90	96
7	14	21	28	35	42	49	56	63	70	77	84	91	98	105	112
8	16	24	32	40	48	56	64	72	80	88	96	104	112	120	128
9	18	27	36	45	54	63	72	81	90	99	108	117	126	135	144
10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160
11	22	33	44	55	66	77	88	99	110	121	132	143	154	165	176
12	24	36	48	60	72	84	96	108	120	132	144	156	168	180	192
13	26	39	52	65	78	91	104	117	130	143	156	169	182	195	208
14	28	42	56	70	84	98	112	126	140	154	168	182	196	210	224
15	30	45	60	75	90	105	120	135	150	165	180	195	210	225	240
16	32	48	64	80	96	112	128	144	160	176	192	208	224	240	256
17	34	51	68	85	102	119	136	153	170	187	204	221	238	255	272
18	36	54	72	90	108	126	144	162	180	198	216	234	252	270	288

BRITISH, OR STERLING MONEY.

4 farthings	make	1 penny.	d.
12 pence	"	1 shilling.	s.
5 shillings	"	1 crown.	cr.
20 shillings	"	1 pound	£

The Shilling contains 3 dwt. 15 $\frac{3}{11}$ grains of silver; and the Sovereign, 5 dwt. 3.274 grains of gold.

CANADA MONEY.

2 coppers	make	1 penny.	d.
12 pence	"	1 shilling.	s.
5 shillings	"	1 dollar	$
20 shillings	"	1 pound	£

UNITED STATES MONEY IN CANADA.

half-dime	=	3 pence.
dime	=	6 pence.
1 York shilling	=	7 pence halfpenny.
25 cents	=	15 pence, or 1s 3d.
half a dollar	=	30 pence, or 2s 6d.
one dollar	=	5 shillings.
half eagle	=	25 shillings.
eagle	=	50 shillings, or $10.

FEDERAL MONEY IN THE UNITED STATES.

10 mills	make	1 cent.	c.
10 cents	"	1 dime.	d.
10 dimes	"	1 dollar.	$.
10 dollars	"	1 eagle.	E.

NOTE.—Accounts in the United States are commonly kept in dollars and cents. This money increases in a tenfold proportion, like whole numbers, which renders it more simple and easy than the money of any other country, France excepted. The attention of the British Government has at last (1841,) been directed to the necessity of a more convenient and uniform system of monies, weights, and measures, by which the use of the heterogeneous mass of 'Tables' that encumber our Arithmetics, and which had their origin in ancient usages, when particular branches of commerce were in their infancy, will be done away with.

WEIGHTS.

Weight is the tendency or force with which bodies of various density fall towards the earth.

The standard of weight is the cubic inch of distilled water weighing 252.458 grains Troy; the Troy pound 5760 grains, or 22.8157 cubic inches. The Avoirdupois pound is 7000 Troy grains, or 27.7274 cubic inches.

TROY, OR GOLDSMITH'S WEIGHT.

24 grains, gr.....1 pennyweight, dwt.
20 pennyweights.....1 ounce, oz. 480 grs.
12 ounces.....1 pound, lb. 5760 grs.

Used to weigh gold, silver, jewells, and liquors.

The Troy pound made of brass in 1785, now in the custody of the Clerk of the British House of Commons, and weighing 5760 troy grains, is the standard wait from which all other weights are derived.

AVOIRDUPOIS WEIGHT.

		Troy Grains.
16 drams make	1 ounce, oz.	437½
16 ounces	1 pound, lb.	7000
28 pounds	1 quarter, qr.	98,000
4 quarters	1 hundredweight, cwt.	784,000
20 hundredweight	1 ton, T.	15,680,000

This weight is used for all articles sold by weight, except those mentioned under Troy and Apothecaries weights.

APOTHECARIES WEIGHT.

		Troy grains.
20 grains make	1 scruple, ℈	20
3 scruples	1 drachm, ʒ	60
8 drachms	1 ounce, ℥	180
12 ounces	1 pound, lb.	5760

Apothecaries prepare their prescriptions by this weight, but buy and sell by Avoirdupois.

APOTHECARIES FLUID MEASURE.

			Cubic Inches.
2 drops	1 minim,	♏	
60 minims	1 dram,	ʒ	0·271
8 drams	1 ounce	℥	2.166
16 ounces	1 pint,	⊙	34.659
8 pints	1 gallon,	cong.	277.274

MEASURES OF LENGTH.

Measure in length is the distance of one object from another, according to some agreed standard. The standard for British measures and those of other countries where science prevails, is the length of a pendulum vibrating seconds, in a vacuum at the level of the sea, which in London measures 39.1393 inches. From this the standard Brass Rod, of the government was made, which regulates the measures now in use.

CLOTH MEASURE.

		Inches.
2¼ inches make	1 nail, n.	
4 nails	1 quarter, qr.	9
4 quarters	1 yard, yd.	36
2½ quarters	1 Ell Hamburgh, E. H.	22½
3 quarters	1 Ell Flemish, E. Fl.	27
5 quarters	1 Ell English, E. E.	45
6 quarters	1 Ell French, E. Fr.	54

LINEAL, OR LONG MEASURE.

12 lines make	1 inch, in.
12 inches	1 foot, ft.
3 feet	1 yard, yd.
5½ yards	1 pole or rod, p.
40 poles, or 220 yards,	1 furlong, fur.
8 furlongs	1 mile, M.
3 miles	1 league, L.
60 geographic, or 69½ statute miles	1 degree, deg.

360 degrees the circumference of the earth.

A Fathom is 6 feet, or 2 yards; a Hand, the sportsman's measure, is 4 inches; a Cubit is 1½ foot; a Span is 9 inches; the Chain for surveying land is 22 yards or 66 feet; and contains 100 links, each 7.92 inches.

MEASURES OF CAPACITY, &c.

WINE, OR LIQUID MEASURE.

		Cubic Inches.
4 gills	1 pint, pt.	28.875
2 pints	1 quart, qt.	57.075
4 quarts	1 gallon, gall.	233.000
10 gallons	1 anker, A.	
18 do	1 runlet, R.	
31½ do	1 barrel, bbl.	
42 do	1 tierce, tr.	
63 do	1 hogshead, hhd.	
84 do	1 puncheon, pun.	
126 do	1 pipe, P.	
252 do	1 tun, T.	

Commonly used in this country to measure Spirits, Wine, Beer, Vinegar, and other liquids.

DRY MEASURE.

2 pints	1 quart, qt.
4 quarts	1 gallon, gal.
2 gallons	1 peck, P.
4 pecks	1 bushel, bus.
8 bushels	1 quarter, qr.
36 bushels	1 chaldron, ch.

Used to measure Grains, Fruit, Salt, Coal, Seed, &c. &c.

IMPERIAL MEASURE.

		Cubic Inches.
5 oz. (avoir.) of water,	1 gill.	8.665
4 gills	1 pint.	34.659
2 pints	1 quart,	69.318
4 quarts	1 gallon,	277,274
2 gallons	1 peck.	554.548
4 pecks	1 bushel.	2218.191
8 bushels	1 quarter,	17745.526

The Imperial gallon contains 277.274 cubic inches of pure water, at the temperature 63° Fahrenheit; or 10 lb. Avoirdupois if weighed when the barometer is at 30 inches; and the other measures are in the same proportion. This measure is used in Britain, for all liquid and dry goods. 100 gallons of this measure are equal to about 120 old wine gallons, or as 1 to 1.20032.

SOLID, OR CUBIC MEASURE.

1728 cubic inches make	1 cubic foot, f.
27 cubic feet	1 cubic yard, yd.
40 cubic feet of rough, or 50 cubic feet of hewn timber	1 load or ton, lc.
42 cubic feet	1 ton of shipping, T. sh.
5 cubic feet	1 barrel of bulk, B.B.
128 cubic feet	1 cord of wood, C.

This measure is used in estimating any thing having length, breadth, and thickness.

SQUARE, OR LAND MEASURE.

144 square inches, s. in.	1 square foot, s. f.
9 square feet	1 square yard, s. yd.
30¼ do yards	1 square pole or perch, s.p.
40 perches	1 rood, R.
4 roods	1 acre, A.
640 square acres	1 square mile, s. m.

36 square yards make 1 rood of Building, and 100 square feet 1 square of flooring.—a square chain is 16 poles—10 square chains, 1 acre. This measure is used in estimating any thing having length and breadth only.

MEASURES OF TIME.

Time is usually measured by certain regular motions, as the rotation of the earth, the swing of a pendulum, the fall of a body, the revolutions of the moon round the earth, or the earth round the sun. The use of the pendulum for this purpose, was first suggested to Galileo, a distinguished Astronomer, on his observing the regular motions of a chandelier, or lamp, hung from the roof of a Cathedral. He thus discovered that, every oscillation, or motion back and forward, of the same pendulum, whether long or short, is performed in THE SAME TIME.

TIME.

60 seconds make 1 minute, min.
60 minutes ..... 1 hour, ho.
24 hours ..... 1 day, da.

A. M. or ante meridian means before mid-day. P. M. or post-meridian, means after mid-day.

7 days ..... 1 week, we.
4 weeks ..... 1 month, mo.
12 calendar months, or .....
13 lunar months, 1 day, 5 hours or
365 days ..... } 1 common, or Julian year.
366 days ..... 1 leap year.
365 days, 5 hours, 48 minutes, and 46 seconds ..... 1 Solar, or Tropical year.

CALENDAR MONTHS, WITH THE DAYS IN EACH.

January,	31	July,	31
February,	28	August,	31
March,	31	September,	30
April,	30	October,	31
May,	31	November,	30
June,	30	December,	31

Thirty days hath September
April, June, and November,
February hath twenty-eight* alone,
And all the rest have thirty-one.

* In leap year 29.

TIME—continued.

NOTE.—Every fourth year is called Bissextile, or Leap year, which gives to the second month, (February) 29 days. To know whether any given year be leap year, divide the date of the year by 4. if there be no remainder, it is leap year. Thus, 1823 divided by 4, leaves a remainder of 3, showing that it is the third year after leap year.

Calendar Months are so called because by them the ordinary calendar or register of the year is kept, and they are unequally of 30 and 31 days, with the exception of February, which is 28, and in leap-year, 29. The 12 months are thus made to correspond as nearly as possible, with the common year of 365 days.

A Lunar Month contains 28 days being the time which the moon takes in revolving round the earth.

A Solar Month is the space of time in which the sun passes through a sign of the Zodiac.

GEOGRAPHICAL, OR NAUTICAL MEASURE.

6075 3/5 feet,	1 nautical mile, naut. m.
3 miles	1 league, league.
20 leagues	1 degree, deg. or ° .
360 degrees	1 circle, or the earth's circumference.

ANGULAR MEASURE, OR DIVISION OF THE CIRCLE.

		Seconds.
60 seconds "	1 minute, marked '	60
60 minutes	1 degree, °	3600
30 degrees	1 sign, s.	108,000
3 signs	1 quadrant,	324,000
4 quadrants, or 12 signs	1 circle, circ.	1,296,000

Used by Astronomers, Navigators, &c.

DIURNAL MOTION OF THE EARTH REDUCED TO TIME.

360 degrees are equal to	24 hours.
15 degrees	1 hour.
1 degree	4 minutes.

APPARENT ANNUAL MOTION OF THE SUN REDUCED TO TIME.

360 degrees, or signs	365	days,	6	h. 0	m, nearly.
30 degrees, or 1 do	30	"	10	30	"
1 degree	1	"	0	21	"

Explanation of Signs or Characters used in Arithmetic.

= Parallell Lines signify equal to, as 20s = £1

+ Perpendicular Cross, signifies plus or more, as 6 + 2 = 8.

— Straight Line, means minus or less, as 8 — 3 = 5.

× Oblique Cross—The sign of multiplication, as 5×6=30

÷ Dotted Line—The sign of division, as 20÷4=5.

: :: :—The sign of proportion, as 6 : 4 :: 12 : 8, thus as 6 is to 4 so is 12 to 8.

PROMISCUOUS MEASURES AND QUANTITIES.

A Scotch and Irish mile is about 1 3-4 English miles. A Russian Verst, 3-4 do. A French League, 3 do. A French Toise, 6 feet. The French Metre, 39 1-2 English inches. A Palm, or Handbreath, 4 do. A cubit 18 do. A Fathom, (4 cubits) 7 feet 3 inches.

12 articles are	1 dozen	6 score	1 great hundred
12 dozen	1 groce,	24 sheets paper.	1 quire,
12 groce	1 great groce,	20 quires	1 ream,*
20 articles	1 score,	60 skins parchment	1 roll.
5 score	1 hundred,		

* The outside quires of a Ream contain only 20 sheets each.

ALIQUOT, OR EVEN PARTS.

PARTS OF A PENNY.

1 farthing is	$\frac{1}{4}$
2 farthings	$\frac{1}{2}$
3 farthings	$\frac{3}{4}$

PARTS OF A SHILLING.

12 pence is	1
6 pence	$\frac{1}{2}$
4 pence	$\frac{1}{3}$
3 pence	$\frac{1}{4}$
2 pence	$\frac{1}{6}$
1½d	$\frac{1}{8}$
1 penny	$\frac{1}{12}$

PARTS OF A DOLLAR.

d.	$
60	1
45	$\frac{3}{4}$
30	$\frac{1}{2}$
15	$\frac{1}{4}$
7½	$\frac{1}{8}$
3¾	$\frac{1}{16}$

PARTS OF A POUND.

s. d	£
20 0 is	1
10 0	$\frac{1}{2}$
6 8	$\frac{1}{3}$
5 0	$\frac{1}{4}$
4 0	$\frac{1}{5}$
3 4	$\frac{1}{6}$
2 6	$\frac{1}{8}$
2 0	$\frac{1}{10}$
1 8	$\frac{1}{12}$

PARTS OF A CWT,

lb.	cwt.
112 is	1
56	$\frac{1}{2}$
28	$\frac{1}{4}$
14	$\frac{1}{8}$
8	$\frac{1}{14}$
7	$\frac{1}{16}$
4	$\frac{1}{28}$

PARTS OF A TON.

cwt.	qrs.	ton.
20	0	1
10	0	$\frac{1}{2}$
5	0	$\frac{1}{4}$
4	0	$\frac{1}{5}$
2	2	$\frac{1}{8}$
2	0	$\frac{1}{10}$
1	0	$\frac{1}{20}$

SCRIPTURE WEIGHTS AND MEASURES.

The design of giving the weights and measures of Scripture is, to enable Instructors to propose questions to their pupils for solution, from the Old and New Testament, which will at once be interesting, instructive, and profitable.

TIME.

The natural Jewish day of 24 hours, was reekoned from sunset to sunset but the artificial day from sunrise to sunset; and it was divided into 12 hours beginning about 6 o clock. Our 7 o'clock in the morning was, therefore, called by the Jews the 1st hour, 8 o' clock the 2d hour, &c. &c. until the 12th. which was about 6 o'clock in the evening At this hour the night commenced, and anciently was divided into three watches, but in our Saviour's time into four, called in Scripture the "evening," "midnight," "cockcrowing," and "morning"

The days of the week were called the First, Second, &c. The first corresponding with the christian Sabbath, and the seventh or Saturday, with the Hebrew Sabbath.

The Jewish civil year began with the autumnal equinox, or the month "Tisri," because it was believed the world was created at that time THE SACRED YEAR began about the vernal equinox or the month "Abib," to commemorate their deliverance from Egyptian bondage; and each consisted of 12 months alternately of 29 and 30 days But as this falls short 11 days of the 365—a month was added to correct the difference, every three or four years called "Veadar"

MEASURES OF WEIGHT AND VALUE.

	WEIGHT. lb oz. d'wt gr	VALUE. in h. c'y. £ s d
The mite,		0 0 0½
The denarius, or Roman penny		0 0 8
The gerah,	0 0 0 11	0 0 1½
The beka,	0 0 4 9	0 1 3
The shekel,	0 0 9 3	f'm 2s a 3
The maneh, or p'nd	2 3 17 12	6 6 0
The talent of silver	114 0 0 0	380 4 2
The talent of gold,	114 0 0 0	6083 6 8

MEASURES OF LENGTH.

The Digit or fingersbreadth,	0.912 inch
The Palm, or handbreadth,	3½ inches.
The Span,	10 do
The Cubit,	18 do
The Sacred Cubit,	2 feet
The Fathom, (4 cubits)	6 feet
Ezekiel's Reed,	10 feet 10 in

MEASURES OF CAPACITY.

The Log, about	¾ pint
The Cab,	3⅓ do
The Omer,	6½ do
The Hin,	1½ gallon
The Seah,	2½ do
The Ephah, nearly a bushel,	7½ do

MISCELLANEOUS.

A Day's Journey, about 33 miles—A Sabbath-day's Journey, about 3-4 mile.

ES.

ture is,
for solu-
nce be

T AND

VALUE. in h. c'y. £ s d
0 0 8
0 0 1½
0 1 3
3 f'm 2s a 3
2 6 6 0
0 38 0 4 2
0 6083 6 8

NGTH.

0.912 inch
3½ inches.
0 do
8 do
2 feet
6 feet
0 feet 10 in

ACITY.

¾ pint
3⅓ do
6¼ do
1½ gallon
2½ do
7½ do

US.

33 miles—A
out 3-4 mile.